



# NATURE-POSITIVE ECONOMY AND THE SINGAPORE INDEX ON CITIES' BIODIVERSITY

Lena Chan

National Parks Board, Singapore

Zero Carbon City International Forum 2023

Ministry of the Environment, Japan, Office of Special Presidential Envoy for Climate, USA,  
ICLEI & the Institute of Global Environmental Strategies

1<sup>st</sup> March 2023



We are embedded in Nature.

Nature underpins our economy.  
For long-term sustainability, we must  
work on the principle of nature-  
positive economy.

Nature encompasses all existing systems on Earth while biodiversity are the living components, including plants, animals, fungi, bacteria, etc.

How do we conserve biodiversity so  
that we can benefit from the  
ecosystem services provided by it?



# City in Nature – a pillar in Singapore Green Plan 2030

Singapore Green Plan announced on 10  
Feb 2021

To create a **green, liveable and sustainable**  
home for Singaporeans





# From “City in a Garden” to “City in Nature”

*A sustainable urban ecosystem, a closer affinity with nature*



## Garden City to City in a Garden

50 yrs of greening

- Intensifying tree planting
- Strengthened connectivity of parks and greenery with PCN
- Integrated greenery with built environment



## City in Nature

Truly unique value proposition where people and nature come first:

- Integrate ecology into the urban landscape
- Create sustainable ecosystems for nature and people to thrive
- Provide immersive experiences with nature for improved health and well being
- Build communities of stewards







## A New Paradigm

Lakeside Garden - Rasau Walk

### City in Nature

Restoring nature back into the city for liveability, sustainability and well-being

Applying nature-based solutions towards achieving:

Climate Resilience

Ecological Resilience

Social Resilience

# Becoming a City in Nature

## Key Strategies

---

- 1 Conserve and Extend our Natural Capital
- 2 Intensify Nature in our Gardens and Parks
- 3 Restore Nature into the Urban Landscape
- 4 Strengthen Connectivity between our Green Spaces

**Everyone has a Role to Play**

**Advance Digitalisation, Science & Technology, Industry**



If we do not measure quantitatively,  
how can we evaluate and monitor  
our biodiversity conservation  
efforts?

# The Singapore Index on Cities' Biodiversity

---

- Tool to help cities evaluate/ monitor their biodiversity conservation efforts

- Key Features:

- self-assessment tool
- easy to apply
- scientifically credible
- objective and fair



- Secretariat of the Convention on Biological Diversity (CBD) – led collaboration with the Global Partnership on Local and Subnational Action for Biodiversity
  - Proposed by Singapore in 2008 at Ninth Conference of Parties to the CBD
  - Three Experts Workshops: Feb 2009, July 2010, Oct 2011
  - ASEAN Workshop in April 2010 (19 cities), June 2014(16 cities)
  - Endorsed in 2010 at Tenth Conference of Parties to the CBD
  - Revised in 2019 to update the indicators



# The Singapore Index Framework

- Part II: Indicators of the Singapore Index
- 28 indicators in 3 components:
  - Native Biodiversity (9 indicators)
  - Ecosystem Services (5 indicators)
  - Governance and Management (14 indicators)
- Score from 0-4 points
- Maximum of 112 points

	Core Components	Indicators
PART II - Indicators	Native Biodiversity in the City	1. Proportion of Natural Areas in the City
		2. Connectivity Measures or Ecological Networks to Counter Fragmentation
		3. Native Biodiversity in Built Up Areas (Bird Species)
		4. Change in Number of Vascular Plant Species
		5. Change in Number of Native Bird Species
		6. Change in Number of Native Arthropod Species
		7. Habitat Restoration
		8. Proportion of Protected Natural Areas
		9. Proportion of Invasive Alien Species
	Ecosystem Services provided by Biodiversity	10. Regulation of Quantity of Water
		11. Climate Regulation – Benefits of Trees and Greenery
		12. Recreational Services
		13. Health and Wellbeing – Proximity/Accessibility to Parks
		14. Food Security Resilience – Urban Agriculture
	Governance and Management of Biodiversity	15. Institutional Capacity
		16. Budget Allocated to Biodiversity
		17. Policies, Rules and Regulations – Existence of Local Biodiversity Strategy and Action Plan
		18. Status of Natural Capital Assessment in the City
		19. State of Green and Blue Space Management Plans in the City
		20. Biodiversity Related Responses to Climate Change
		21. Policy and/or Incentives for Green Infrastructure as Nature-based Solutions
		22. Cross-sectoral and Inter-agency Collaborations
		23. Participation and Partnership: Existence of Formal or Informal Public Consultation Process Pertaining to Biodiversity Related Matters
		24. Participation and Partnership: Number of Agencies/Private Companies/NGOs/Academic Institutions/International Organisations with which the City is Partnering in Biodiversity Activities, Projects and Programmes
		25. Number of Biodiversity Projects Implemented by the City Annually
		26. Education
		27. Awareness
		28. Community Science

# Singapore Index Handbook

- Published 2021 as CBD technical series #98

Secretariat of the  
Convention on  
Biological Diversity

CBD Technical Series No. 98



# 98

## HANDBOOK ON THE SINGAPORE INDEX ON CITIES' BIODIVERSITY

(also known as the  
City Biodiversity Index)



### INDICATOR 8

#### PROPORTION OF PROTECTED NATURAL AREAS



##### RATIONALE FOR SELECTION OF INDICATOR

Protected or secured natural areas indicate the city's commitment to biodiversity conservation. Hence, the proportion of protected or secured natural areas is an important indicator.

The definition of protected natural areas should be broadened to include legally protected, formally secured areas, and other administratively protected areas, as different cities have different terminologies and means for protecting their natural areas.

At the 10<sup>th</sup> Meeting of the Conference of the Parties to the Convention on Biological Diversity, Target 11 of the Aichi Biodiversity Targets, i.e., "By 2020, at least 17 per cent of the terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes" was negotiated and adopted in 2010 ([www.cbd.int](http://www.cbd.int)). This indicator takes reference from this Aichi Target 11.

##### HOW TO CALCULATE INDICATOR

$$\frac{(\text{Area of protected or secured natural areas})}{(\text{Total area of the city})} \times 100\%$$

##### WHERE TO GET DATA FOR CALCULATIONS

Possible sources of data include government agencies in charge of biodiversity, city municipalities, urban planning agencies, biodiversity centres, nature groups, universities, publications, etc.

##### BASIS OF SCORING

Taking into consideration that cities, by definition, are urbanised centres with predominantly built-up areas (see Indicator 1), therefore the scoring for proportion of protected natural areas will have to factor in that most cities would have less than 20% of the city area covered by natural areas. The scoring is determined based on ensuring congruency with Indicator 1 and taking into account Target 11 of the Aichi Biodiversity Targets.

**0 POINTS:** <1.0%

**1 POINT:** 1.0% to 6.0%

**2 POINTS:** 6.1% to 11.0%

**3 POINTS:** 11.1% to 17.0%

**4 POINTS:** >17.0%



# Indicators of the Singapore Index

- Native Biodiversity in the City (9 indicators)

- 1) Proportion of Natural Areas in the City
- 2) Connectivity Measures or Ecological Networks to Counter Fragmentation
- 3) Native Biodiversity in Built Up Areas (Bird Species)
- 4) Change in Number of Vascular Plant Species
- 5) Change in Number of Native Bird Species
- 6) Change in Number of Native Arthropod Species
- 7) Habitat Restoration
- 8) Proportion of Protected Natural Areas
- 9) Proportion of Invasive Alien Species

- Sub-total for indicators 1-9: 36 points



# Indicators of the Singapore Index

---

- Ecosystem services provided by biodiversity (5 indicators)
  - 10) Regulation of Quantity of Water
  - 11) Climate Regulation – Benefits of Trees and Greenery
  - 12) Recreational Services
  - 13) Health and Wellbeing – Proximity/Accessibility to Parks
  - 14) Food Security Resilience – Urban Agriculture
- Sub-total for indicators  
10-14: 20 points





# Indicators of the Singapore Index

---

- Governance and Management of Biodiversity (14 indicators)
  - 15) Institutional Capacity
  - 16) Budget Allocated to Biodiversity
  - 17) Policies, Rules and Regulations – Existence of Local Biodiversity Strategy and Action Plan
  - 18) Status of Natural Capital Assessment in the City
  - 19) State of Green and Blue Space Management Plans in the City
  - 20) Biodiversity Related Responses to Climate Change
  - 21) Policy and/or Incentives for Green Infrastructure as Nature-based Solutions
  - 22) Cross-sectoral and Inter-agency Collaborations
  - 23) Participation and Partnership: Existence of Formal or Informal Public Consultation Process Pertaining to Biodiversity Related Matters
  - 24) Participation and Partnership: Number of Agencies/Private Companies/NGOs/Academic Institutions/International Organisations with which the City is Partnering in Biodiversity Activities, Projects and Programmes
  - 25) Number of Biodiversity Projects Implemented by the City Annually
  - 26) Education
  - 27) Awareness
  - 28) Community Science
- Sub-total for indicators 15-28: 56 points

# Current applications

- 39 city governments have applied the SI, and academics have applied the SI to a further 15 cities. In addition, 12 more city governments are currently in the process of applying the SI



## Legend

- Cities that have applied SI
- Cities where the SI was applied by academics
- Cities that are currently in the process of applying SI



# THANK YOU

SI Handbook, download at CBD website:  
<https://www.cbd.int/doc/publications/cbd-ts-98-en.pdf>  
For more information, please email:  
[Singapore\\_Index@nparks.gov.sg](mailto:Singapore_Index@nparks.gov.sg)

Photo by: Max Khoo